DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-7, 9-18, 70, and 71 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Jin teaches that flux pinning enhancement by substitution into Y produces insignificant results and that future efforts should be focused on substitution into the other lattice sites.

However, it appears that Jin teaches that superconductors with the rare earth site partially substituted do have a higher Jc than that of a control Y-123 superconductor (Table II, page 78). Jin does not appear to teach away from chemical substitution even though the reference recites that "future efforts should be concentrated on Ba-, Cu, or O-site substitution." This recitation seems to point out that chemical substitution in merely a non-preferred embodiment. Jin does not teach that rare earth site substitution is disparaged as a bad result, only that other site substitutions may yield a better result. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. MPEP 2123 (I). To this point, "[a] known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." MPEP 2123 (I). In the instant case, amount of increase in the value of Jc (as a result of the rare earth element being substituted) described in Jin could be viewed by one of ordinary skill in the art as an improvement over the control Y-123

superconductor. This holds true even if, *arguendo*, it was a fact that substitution of other sites in the Y-123 superconductor resulted in a higher Jc.

Claim Objections

Claim 1 is objected to because of the following informalities: line 4 of claim 1 recites "rare earth-alkaline earth metal-transition metal" while line 8 of claim 1 recites "rare-earth/alkaline-earth-metal/transition metal". It appears that these two recitations refer to the same subject. However, it is suggested that one of the recitations is amended to provide uniformity.

In line 8 of claim 1, the recitation "one or more of the rare earth of the…". However, it appears that the recitation of "one or more" is unnecessary as the claim has been amended to delete "and alkaline earth metal" in the claim amendments filed on 4/14/09. Therefore, it is requested that "one or more of" in line 8 is deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, 9-18, 70, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of…).

Riley teach a process of disposing a precursor solution onto a biaxially textured substrate (page 7) to form a precursor film wherein the precursor components comprise an organic solution of metal trifluoroacetates prepared from powders of salts of barium, yttrium, and copper wherein after application, the precursor is heat treated to a temperature of 300-500°C (page 19) at a rate of at least 5°C per minute (page 22) wherein the intermediate film is heated at a temperature of 700-825°C in the claimed environment (page 22).

Riley fail to teach that a dopant comprising a metal compound is in the precursor solution that is capable of replacing one or more of the rare earth and alkaline earth metal of the rare-earth/alkaline-earth/transition metal oxide.

Jin teach a method of making superconductors (page 75) wherein a YBCO superconductor with 20% of yttrium substituted with a second rare earth element (holmium is a second rare earth element used for substitution of yttrium, page 76, 78) exhibits a higher Jc than a YBCO superconductor without the substitution (page 78).

Additionally, Jin teaches that all of the starting materials are mixed together to form a precursor mixture (page 76, first column).

As Jin teaches a method of making superconductors (page 75) wherein a YBCO superconductor with 20% of yttrium substituted with a second rare earth element (holmium is a second rare earth element used for substitution of yttrium, page 76, 78) exhibits a higher Jc than a YBCO superconductor without the substitution (page 78) and that all of the starting materials are mixed together (including the dopant starting material) to form a precursor mixture (page 76, first column), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to add a dopant rare earth element to a precursor solution of Riley in order to make a superconductor having a higher Jc than a YBCO superconductor without the substitution (page 78) as taught by Jin.

Regarding claims 4 and 5, Weinstein teach that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6).

As Weinstein teaches that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute an element in the superconductor of Riley with an element present in the amount of 0.01-1% of the entire material.

This range appears to overlap with the range in claims 4 and 5.

Regarding claims 12-17, Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water during the heating of the intermediate oxyfluoride film (page 20).

Additionally, the claimed heat ramps could be discovered through routine experimentation.

As Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water (page 20) and because the claimed heat ramps could be discovered through routine experimentation, it would have been obvious to one ordinary skill in the art at the time applicant's invention was made to provide a heating ramp of greater than 200°C per minute during the heat treatment of the oxyfluoride intermediate film of Riley.

Regarding claim 18, the prior art teach a substantially similar process as that instantly claimed such that the properties resulting from the prior art process are substantially similar to those instantly claimed, including orientation.

Regarding claim 71, Jin suggests that barium in YBCO should be substituted with another element (page 78).

As Jin suggests that barium in YBCO should be substituted (page 78), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute the barium in the YBCO of Riley with another element.

Claims 12-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of…) and Weinstein (U.S. 6869915).

Riley teaches a method of making a superconductor as described above in claim 1.

If Riley fails to teach the claimed heat ramps, Weinstein teaches a process for producing a superconductor wherein a precursor is heated to form an oxyfluoride intermediate film, where after the intermediate film is heated at a temperature less than 810°C (col. 11).

As Weinstein teaches a the intermediate film is heated at a temperature less than 810°C (col. 11), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to heat the intermediate oxyfluoride film of Riley at a temperature less than 810°C (col. 11).

While Weinstein does not explicitly disclose that the intermediate film is heated instantaneously, Weinstein does recite that "the coating is heated…**at** a temperature of less than 810°C" (emphasis added, col. 11, lines 25-30). As this disclosure in Weinstein recites "at" a temperature rather than "to a" temperature, it appears that Weinstein teaches an instantaneous heating or a heating ramp that overlaps the claimed heating ramp.

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of…) and Wiesmann et al. (US 2003/0050195).

Riley teaches a method of making a superconductor as described above in claim 1.

If Riley fails to teach that the intermediate film is heated at a temperature ramp of about greater than 25°C per minute, Wiesmann, however, teaches a method of making

superconductors [0002] wherein a precursor film comprising Ba, Y, Cu, and F is heated from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in order to form a YBCO superconductor [0050].

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide heating a precursor film from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in Riley in order to form a YBCO superconductor [0050] as taught by Wiesmann.

It appears that the value of 25 overlaps with the recitation of "greater than about 25".

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.); In re Geisler, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997). MPEP 2144.05 (I).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of…) and Feenstra (U.S. 5972847).

Riley teaches a process for making a superconductor as described above in claim 1.

If Riley fails to teach that the oxide superconductor is biaxially oriented and that the oxide superconductor has a c-axis orientation that is substantially constant across its width, the c-axis orientation of the oxide superconductor being substantially perpendicular to the surface of the substrate, Feenstra teaches a method for making superconductors (col. 1) wherein it is known that biaxial texture is required to obtain high transport critical current densities (col. 1). Also taught is that the most favorable YBCO orientation is with c-axis perpendicular to the substrate (col. 4).

Riley teaches that a-axis oriented grains should be minimized (page 27).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide biaxial textured superconductors and c-axis perpendicular to the substrate in Riley for the purpose of obtaining high transport critical current densities the most favorable YBCO orientation is with c-axis perpendicular to the substrate as taught by Feenstra. Additionally, one would be motivated to provide c-axis orientation constant as Riley teaches that a-axis oriented grains should be minimized.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
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/Stanley Silverman/
Supervisory Patent Examiner, AU 1793